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09/823,852	03/29/2001	Naoyasu Miyagawa	CALMP029	7011

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LSI LOGIC CORPORATION
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PATENT LAW DEPARTMENT
MILPITAS, CA 95035

EXAMINER

PATEL, GAUTAM

ART UNIT	PAPER NUMBER
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2655

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DATE MAILED: 01/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,852

Applicant(s)

MIYAGAWA ET AL.

Examiner

Gautam R. Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application:
- 4a) Of the above claim(s) 1,2,14 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-13 and 16-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

#10

DETAILED ACTION

1. Claims 1-29 are pending for the examination.

Election/Restriction

2. Claims 1-2 and 14-15 withdrawn from further consideration by the examiner, 37 C.F.R. § 1.142(b) as being drawn to groups A, B and D. Election was made with traverse of claims 3-13 and 16-29

Applicant's election with traverse of group C in Paper No. 8 is acknowledged. The traversal is on the ground(s) that "Congress wisely granted the *discretion* [original emphasis] to restrict applications. ... the commissioner *may* [original emphasis] require the application to be restricted ..."

In searching the Group C claims, the class and subclass for the Group A, B and D claims will undoubtedly be searched, to ensure the no relevant art is overlooked. For this reason there is no serious burden as required by MPEP § 803. In fact, maintaining the requirement for restriction not only burdens applicants with the additional costs associated with filings and prosecuting separate patent applications, but also requires the examiner to duplicate efforts by examining multiple applications of closely related inventions. Such practice not only wastes public and private funds and Patent Office resources, but also leads to the possibility of inconsistent examinations of closely related inventions."

This is not found persuasive because, first of all, it is not up to the Examiner to decide or even pass judgment on the wisdom or intelligence of the congress. The poor Examiner readily admits his utter inability to judge the wisdom or depth of the intelligence of the congress. However the Examiner is fairly certain, which way ninety out of the hundred *intelligent* people surveyed would vote, if the hundred people were to be asked a question regarding the wisdom of the congress and with which the congress operates. Here the key word being intelligent people. Since the MPEP is silent about

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such an esoteric subject matter, the Examiner is cheerfully and unequivocally ready to agree with the Applicants assessment of the wisdom of congress.

Now the key words as pointed out by the Applicants themselves are "*discretion*" and commissioner *may* require the application to be restricted, the only question remains is that of the criteria. The inventions are independent and distinct by definition, as they are being classified in different class and have received a separate status in the art. As to the serious burden to the poor examiner, only examiner knows how burdened he is when he has to go in four different directions. As to burden and/or cost to the Applicants and wastage of public and private funds, MPEP is silent. It is up to the Applicants to file and/or not file further applications. As to the inconsistent examinations of closely related inventions, it seems the Applicants are contradicting themselves by arguing opposite things at the beginning of the of paragraph and at the end of the same paragraph, by first arguing that these claims are very closely related and hence could be examined together and also arguing at the same time, that this kind of examination will cause inconsistent examination. Since MPEP is also silent on this subject these arguments are moot.

The requirement is still deemed proper and is therefore made **FINAL**.

Applicant is reminded that **upon the cancellation of claims to a non-elected invention, the inventorship must be amended** in compliance with 37 C.F.R. § 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 C.F.R. § 1.48(b) and by the fee required under 37 C.F.R. § 1.17(h).

Drawings/Objection

3. The drawings are objected for following reasons:

1. Reference signs for figures 8A to 8D are not included in the drawings. It is not clear which figure is what (see 37 CFR ' 1.84p).

Corrections are required.

2. The drawings are objected to under 37 C.F.R. § 1.83(a). The drawings must show *every feature* of the invention specified in the claims. Therefore, the "steps of mapping the data to set of write symbols, defining a set of variable write parameters and substeps of generating a plurality of candidate write symbols readout waveforms etc." must be shown or the feature canceled from the claim. Also "matched filter" as claimed in claim 11 to recover the data and calculation of cross correlation coefficient, as claimed in claim 12, must be shown or removed from the claim. Similar problems exist with claims 16-29.

No new matter should be entered.

Correction is required.

Applicant is required to submit a proposed drawing correction in response to this Office Action. Any proposal by the applicant for amendment of the drawings to cure defects must consist of following:

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment, and may be **accompanied by a marked-up copy of one or more of the figures being amended, with annotations**. Any replacement drawing sheet **must be identified in the top margin as "Replacement Sheet"** and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. **Any marked-up (annotated) copy showing changes must be labeled "Annotated Marked-up Drawings" and accompany the replacement sheet in the amendment (e.g., as an appendix).**

Specification

4. The disclosure is objected for following reasons.

The title of the invention is neither precise nor descriptive. A new title is required which should include, using twenty words or fewer, claimed features that differentiate the invention from the Prior Art. It is recommended that the title should reflect the gist of or the improvement of the present invention.

Correction is required.

Corrections are required.

Claim Rejections - 35 U.S.C. § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 3-7, 11-13, 16 and 25-28 are rejected under 35 U.S.C. § 102(b) as being anticipated by Fuji, US. patent 5,537,381 (hereafter Fuji).

As to claim 3, Fuji discloses the invention as claimed [see Figs. 1-31, especially 11-15] including mapping the data to a set of write symbols, defining a set of variable write parameters, generating a plurality of candidate write symbols, generating a plurality of readout waveforms, analyzing the readout waveforms, selecting selected ones of the plurality of candidate write symbols and writing the data to the medium, comprising the steps of:

mapping the data to a set of write symbols wherein each write symbol represents more than one bit of the data and wherein the set of write symbols is defined by [col. 14, line 41 to col. 15, line 29 and fig. 13]:

defining a set of variable write parameters [col. 14, line 50 to col. 15, line 29 and fig. 13];

generating a plurality of candidate write symbols [fig. 12] that specify different values for the variable write parameters [col. 13, line 50 to col. 14, line 15];

generating a plurality of readout waveforms [fig. 14 & 15] produced by the plurality of candidate write symbols [col. 14, line 41 to col. 15, line 29];

analyzing the readout waveforms to determine a set of distinguishable readout waveforms [col. 14, line 41 to col. 15, line 29]; and

selecting selected ones of the plurality of candidate write symbols that correspond to the distinguishable readout waveforms to be included in the set of write symbols [col. 14, line 41 to col. 15, line 29]; and

writing the data to the medium using the write symbols [col. 14, line 41 to col. 15, line 29].

6. As to claim 4, Fuji discloses:

the medium is an optical disc [col. 23, lines 11-20].

7. As to claim 5, Fuji discloses:

the medium is a phase change optical disc [col. 23, lines 11-20].

8. As to claim 6, Fuji discloses:

the set of variable write parameters defines characteristics of a sequence of laser pulses [col. 14, lines 1-12 and fig. 11].

9. As to claim 7, Fuji discloses:

the set of variable write parameters defines the timing of a sequence of laser pulses [col. 13, lines 49-56].

10. As to claim 11, Fuji discloses:

a matched filter is used to recover the data [fig. 10, unit 49] [col. 13, lines 50-67].

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NOTE: see also fig. 1.

11. As to claim 12, Fuji discloses:

a cross correlation coefficient is calculated to recover the data [col. 13, lines 50-67].

NOTE: see also fig. 1.

12. As to claim 13, Fuji discloses:

a combination of a cross correlation coefficient and comparison of a DC level is used to recover the data [col. 19, lines 1-9].

13. As to claim 16, it is rejected for the same reasons set forth in the rejection of claim 3, supra.

14. As to claims 25-28, they are claims corresponding to claims 4-7 respectively and they are therefore rejected for the same reasons set forth in the rejection of claims 4-7 respectively, supra.

Claim Rejections - 35 U.S.C. § 103

15. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuji as applied to claim 3-7 above and in view of Pettigrew et al., US. patent 4,703,469 (hereafter Pettigrew).

Fuji discloses all of the above elements, including write symbols generation and avoiding the thermal crosstalk and inter-symbol interference by detecting "delta v" [see col. 9, lines 14-67]. Fuji does not specifically disclose that the same goal of reducing thermal crosstalk and inter-symbol interference can also be achieved by well-known method of inserting guard bands.

However, it is well known in the art that all recording inherently have to have guard bands to avoid crosstalk between tracks or between any data such as write symbols. Without guard bands data cannot be read properly and system will not function at all. And by using guard bands of appropriate size crosstalk between adjacent data [write symbols] can be reduced or avoided. Also Pettigrew clearly discloses that it is well known in the art:

writing the data to the medium includes inserting guard bands between the write symbols [ABSTRACT, and col. 1, lines 11-34 and col. 4, line 61 to col. 5, line 19 and fig. 1].

Both Fuji and Pettigrew are interested in improving the read/write mechanism of an optical disk. Both Fuji and Pettigrew show system to reduce crosstalk and thermal interference, both create write symbols for optical disks.

One of ordinary skill in the art at the time of invention would have realized that the crosstalk and inter-symbol interference is present on all the disks at all data levels that are recorded and reduction of these kind of noises is a good and necessary characteristic to have. Therefore, it would have been obvious to have used guard band mechanism in the system of Fuji as taught by Pettigrew because one would be motivated to reduce noise and cross-talk or intersymbol interference in the system of Fuji and provide better signal controls with help of well known guard bands and improve quality of the write symbol signals [col. 1, lines 11-29; Pettigrew].

NOTE: Pettigrew discloses guard bands between tracks, but since different write symbols can be and are generally recorded on different tracks also. The same guard

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bands or concept of the guard bands are also equally applicable to guard bands between write symbols.

16. As to claim 9, Pettigrew discloses:

writing the data to the medium includes inserting guard bands between the write symbols wherein the guard bands are appropriately sized to avoid intersymbol interference [ABSTRACT, and col. 1, lines 11-34 and col. 4, line 61 to col. 5, line 19 and fig. 1].

17. As to claim 10, Pettigrew discloses:

writing the data to the medium includes inserting guard bands between the write symbols wherein the guard bands are appropriately sized to avoid thermal crosstalk [ABSTRACT, and col. 1, lines 11-34 and col. 2, lines 13-63].

18. Claims 17-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuji as applied to claims 3-7 and 16 above, and further in view of McNeil et al., US. patent 5,995,305 (hereafter McNeil).

Fuji discloses all of the above elements, including write symbols that specify different values for the variable write parameters. Fuji does not specifically disclose what kind of algorithm is being used for generation of the write symbols.

However, it is well known in the art that all recording patterns inherently have to be generated by some kind of algorithm, specific and/or generic. Also McNeil clearly discloses:

generating a plurality of candidate write symbols that specify different values for the variable write parameters includes using a genetic algorithm to generate the plurality of candidate write symbols [col. 6, lines 26-53].

Both Fuji and McNeil are interested in improving the read/write mechanism of an optical disk. Both Fuji and McNeil disclose write pattern generation by controlling laser current and power.

One of ordinary skill in the art at the time of invention would have realized that all kind noise and disturbance needs to be control in all kind environment including off-track noise. Ability to control off-track noise is a good characteristic to have in a system and appropriate algorithm needs to be applied for this ability. Therefore, it would have been obvious to have used an optimization algorithm [generic algorithm] in the system of Fuji as taught by McNeil because one would be motivated to reduce noise and cross-talk or intersymbol interference under all conditions in the system of Fuji and provide better signal controls with help of well known bands and improve quality of the signals [col. 5, lines 38-52; McNeil].

19. As to claim 18, McNeil discloses:

generating a plurality of candidate write symbols that specify different values for the variable write parameters includes randomly generating the plurality of candidate write symbols [col. 7, lines 48-67].

20. As to claim 19, McNeil discloses:

generating a plurality of candidate write symbols that specify different values for the variable write parameters includes using expert knowledge to generate the plurality of candidate write symbols [col. 9, lines 15-67].

21. As to claim 20, McNeil discloses:

a plurality of candidate write symbols that specify different values for the variable write parameters includes using expert knowledge to generate an initial set of candidate write symbols and using a genetic algorithm to refine the initial set of candidate write symbols [col. 9, lines 15-67]. [col. 9, lines 15-67].

22. As to claim 24, McNeil discloses:

analyzing the readout waveforms produced by the marks to determine a set of readout waveforms that match a read/write channel that includes the recording medium

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includes determining ideal readout waveforms follow the read/write channel SNR spectrum [col. 5, lines 13-37 and TABLE 1].

23. Claims 21-23 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuji in view of McNeil as applied to claims 16-20, and 24 above, and further in view of Kobayashi et al., US. patent 5,978,333 (hereafter Kobayashi).

Fuji discloses all of the above elements, including write symbols that specify different values for the variable write parameters. Fuji does not specifically disclose that this procedure includes selecting a pair of waveforms to represent individual channel bits and also manipulating these bits to produce desired results.

However, complimentary waveforms [mirror image of each other] are well known in the art for recording patterns on an optical disk. Also Kobayashi clearly discloses:

generating a plurality of candidate write symbols that specify different values for the variable write parameters includes selecting a pair waveforms to represent individual channel bits [col. 3, line 60 to col. 4, line 12].

Both Fuji and Kobayashi are interested in improving the read/write mechanism of an optical disk. Both Fuji and Kobayashi discloses write pattern generation by controlling laser current and power under different condition including wobble pattern.

One of ordinary skill in the art at the time of invention would have realized that intensity of the reflection is not constant in mark position and guard-band or gap, and therefore it is difficult to achieve exact reproduction. Ability to achieve exact reproduction is a desired characteristic to have in a system. Therefore, it would have been obvious to have used an a pair waveforms to represent individual channel bits in the system of Fuji as taught by Kobayashi because one would be motivated to achieve exact reproduction in the system of Fuji and provide better signal controls [col. 1, lines 36-44; Kobayashi].

24. As to claim 22, Kobayashi discloses:

generating a plurality of candidate write symbols that specify different values for the variable write parameters includes selecting a pair waveforms to represent individual channel bits and shifting and adding combinations of the waveforms [col. 12, line 5 to col. 13, line 20].

25. As to claim 23, Kobayashi discloses:

generating a plurality of candidate write symbols that specify different values for the variable write parameters includes selecting a pair waveforms to represent individual channel bits [col. 3, line 60 to col. 4, line 12]. As to the rest of the claim McNeil discloses:

wherein the spectrum of the pair of waveforms becomes band-limited and closely resembling the channel's spectrum of signal-to-noise ratio, SNR(f) [col. 5, lines 13-37 and TABLE 1].

26. As to claim 29, Fuji teaches all of the above limitations including recovering data. Fuji does not teach well known use of viterbi detector. "Official Notice" is taken that both the concept and the advantages of providing a viterbi detector are well known and expected in the art. It would have been obvious to include a viterbi detector in the system of Fuji as this viterbi detector are known to provide better decoding for these kind of signals and thereby saving time and money on the decoding these signals These concepts are well known in the art and do not constitute a patentably distinct limitation, per se [M.P.E.P. 2144.03].

Other prior art cited

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Yanagimoto et al. (US. patent 6,195,215) Measurement apparatus ...
2. Fisher et al. (US. patent 5,576,906) Synchronous detection of concurrent servo bursts ...

3. Kavcic et al. (US. patent 6,201,839) Method and apparatus for correlation sensitive adaptive sequence detection.

4. Yamaguchi et al. (US. patent 5,675,569) Read back circuit for an optical
...

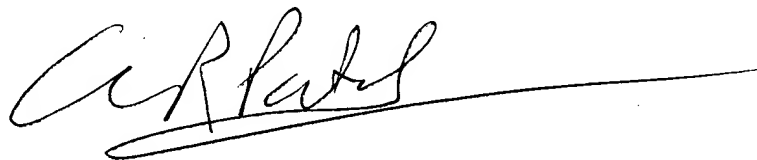
Contact information

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gautam R. Patel whose telephone number is (703) 308-7940. The examiner can normally be reached on Monday through Thursday from 7:30 to 6.

The appropriate fax number for the organization (Group 2650) where this application or proceeding is assigned is (703) 872-9314.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Doris To can be reached on (703) 305-4827.

Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 305-4700 or the group Customer Service section whose telephone number is (703) 306-0377.

A handwritten signature in black ink, appearing to read 'G. R. Patel', with a long horizontal line extending to the right.

Gautam R. Patel
Patent Examiner
Group Art Unit 2655

January 19, 2004